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The Agricultural Student



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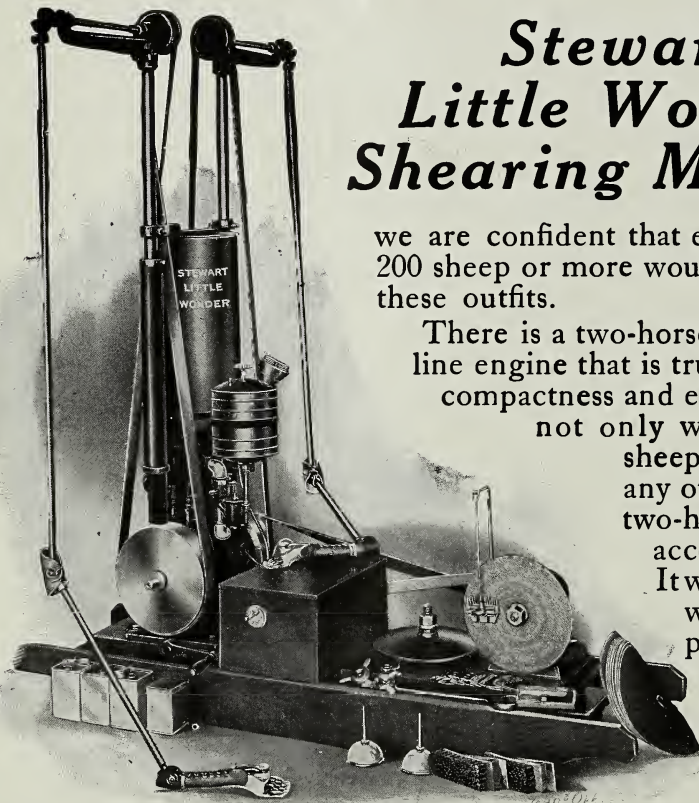
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MAY, 1913

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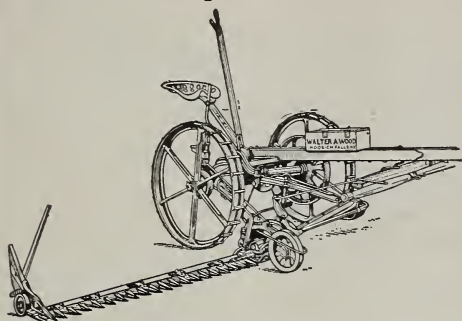
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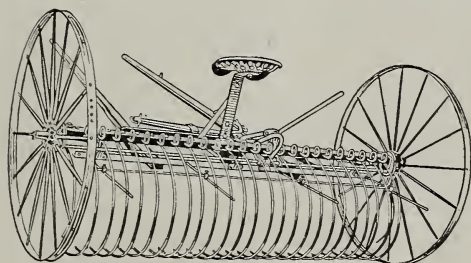
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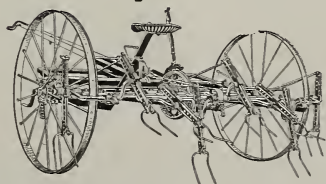
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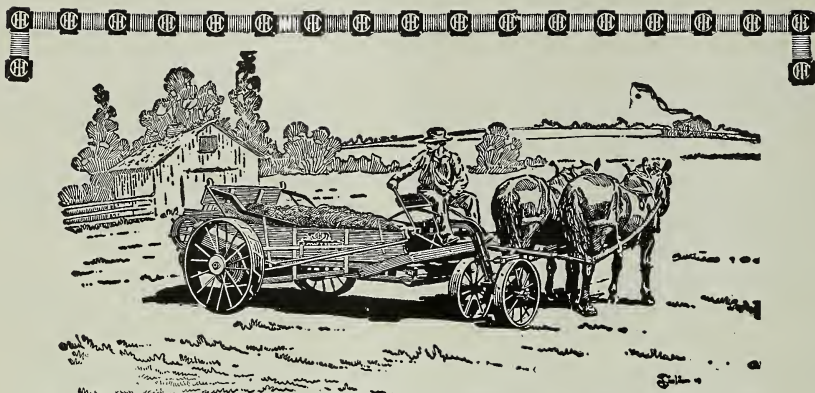
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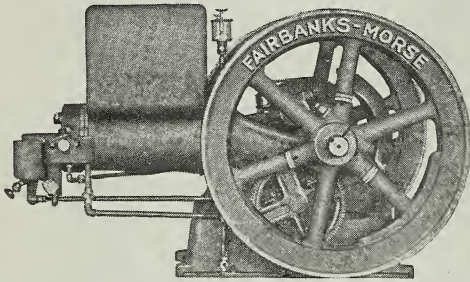
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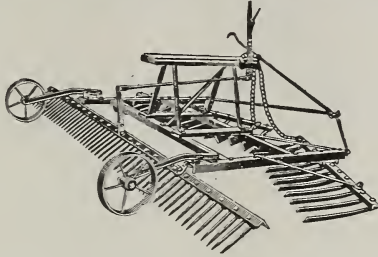
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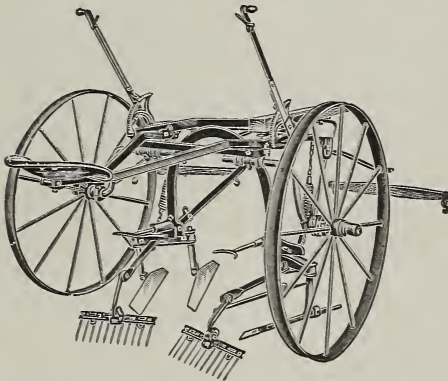
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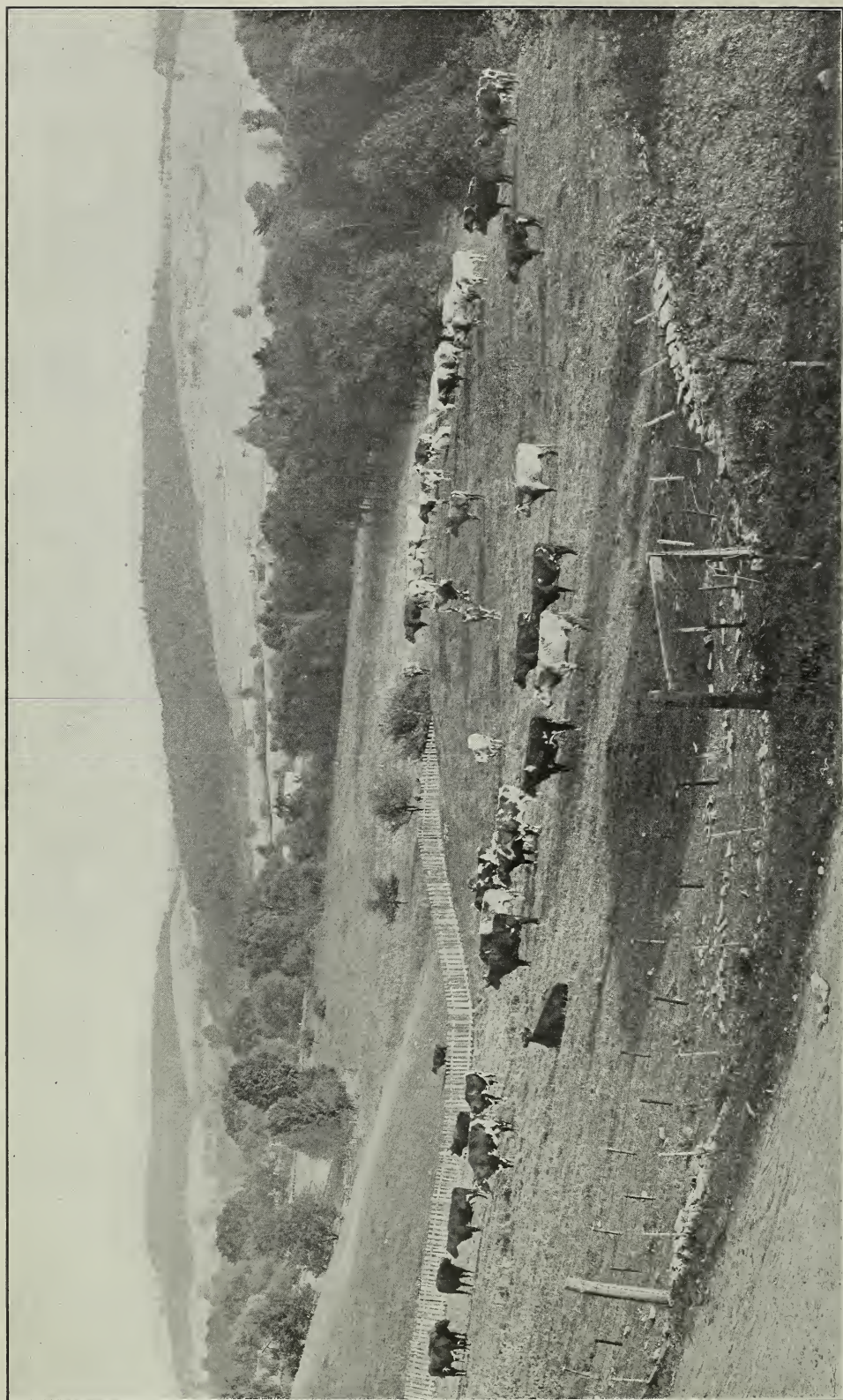
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California Poppies (Eschscholtzia).

Contents

FRONTISPIECE—Pasture Scene—Tannenbaum Farms	632
SPOTS WHICH MAY OCCUR ON THE APPLE LEAF—	
L. E. Melchers	633
SWEET PEAS—	
Prof. L. M. Montgomery, Horticultural Department.....	637
PICTURESQUE OHIO—III.—	
Hollis Kight	639
SHEEP SHEARING FESTIVALS—	
James F. Walker, '14	643
WORK OF A BIOLOGICAL SURVEY—	
Prof. Herbert Osborn, Department of Zoology.....	646
CONDITIONS NECESSARY FOR CO-OPERATION—	
Ray Berlin Hugus, '13.....	648
THE CANNING OF FRUITS AND VEGETABLES—	
J. T. Minton	650
EDITORIALS	652-654
DEPARTMENTS	655-663
NEWS NOTES	664-667



THE AGRICULTURAL STUDENT

Vol. XIX.

OHIO STATE UNIVERSITY, COLUMBUS, MAY, 1913

Number 9

Spots Which May Occur on the Apple Leaf

L. E. MELCHERS

IN studying Plant Pathology we find that there is a certain class of plants, fungi, which do not live independently but derive their nourishment from other plants, thereby reducing the vitality of the host. Plant Physiology teaches us that the leaves of a plant are complicated organs and by investigating their functions we find what an important role they play in digestion and assimilation. When the leaves of an apple tree are attacked by a fungus its functional activities are reduced, and this casts a reflecting result on the tree as a whole.

It happens that the foliage of our pome fruits and particularly the apple, are attacked by parasite fungi which cause an underestimated injury to the annual fruit crop. When leaves of an apple tree become parasitized or if early defoliation results, the various functions of that tree are interfered with, not merely for that particular season, but for the following as well. If the foliage is attacked by a fungus disease or is otherwise injured, we can readily notice its effects on the color, size and quality of the fruit. How could we possibly expect to have an accumulation of reserve food stored up in our tree for next year's use, when the supply is too limited to develop the crop in a normal manner this season. The harmful effect of foliage diseases may be seen the following spring when weak blossoms are produced, or there may be an entire lack of bloom.

There are two common ways in which apple foliage may suffer. (1) From a fungus disease. (2) From some mechanical or environmental factor. Examples of the first class are: Frog-Eye, Leaf Spot, Cedar Apple Rust and Apple Scab. Spray Injury would be an example of the second class, and is of interest on account of its close resemblance to spots produced by fungi.

The Frog-Eye Leaf Spot, (*Sphaeropsis Malorum* Berk.)

The fungus receives its name from the characteristic spot which it causes upon the upper surface of the foliage. These are in the form of elliptical dead areas, varying from one-eighth, to nearly an inch in diameter where they coalesce. (See fig. one lower right hand corner.) These areas are brown, or brown interspersed with grey rings. In the center of each spot is a small, greyish white area which is surrounded by the darker concentric rings.

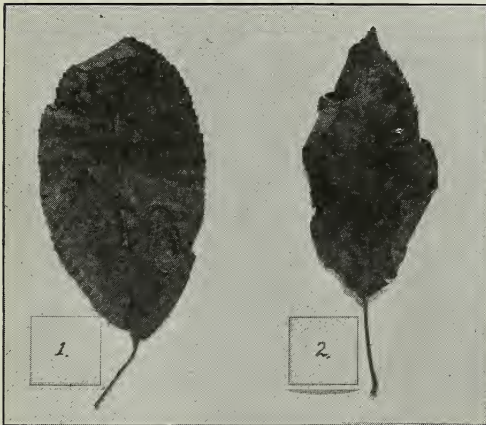
Infection gains entrance during the early part of the spring or summer depending somewhat upon weather conditions. This peculiar trouble has been assigned to various fungi and environmental conditions. The spores of Black Rot of the apple, (*Sphaeropsis Malorum* Berk.), which causes the well known Black Rot Canker on the apple tree and which so often attacks the fruit, is probably the organism which produces this spot in the majority of cases, although other fungi which have been associated

with this trouble the, species of *Phyllosticta* and *Coniothyrium*.

Warm, rainy or "muggy" summer months seem to be the ideal weather conditions for its development. This fungus trouble occurred in different localities of the state this season, particularly in the southern areas. Altho this disease is perhaps not the worst of the above foliage troubles, it has attracted considerable attention and it not to be overlooked. It is of interest to note that this disease is three fold in its attacks, namely, it occurs on the branch, on the fruit and on the leaves.

Treatment for Frog-Eye Leaf Spot.

Clean cultivation would in all probabilities help to reduce this trouble, be-



No. 1—THE FROG EYE LEAF SPOT.

No. 2—INJURED BY LIME-SULPHUR SPRAY.

cause the spores winter over on the dead foliage. The removal of cankers and the destruction of "mummies," would also help. In Ohio apple orchards the clean cultivation method is not practiced so we have to look towards some other source for a means of control. Indications are, that the early sprays are the most effective in controlling this foliage spot, using either Bordeaux mixture or lime sulphur.

The Cedar Apple Rust, (*Gymnosporangium macropus* Lk.)

This disease is quite common thruout the State wherever Junipers are growing. The fungus passes part of its life history upon the above named evergreens, where it forms characteristic "Cedar Apples." These are horn like, gelatinous masses, which produce the resting spores. Little secondary spores, (sporidia), are produced when the resting spores germinate, and it is these which infect the apple leaves and the fruit. The first indication of this disease upon the leaves is the development of yellow, circular spots upon the upper surface. These spots contain little pustules which soon turn to a dark color. (See figure three.) Not long after this you will notice the infected spot, but on the under surface of the leaf, a spore bearing cushion, which really consists of a mass of hair like bodies or minute tubes, these are known as aecidia. It is the aecidial stage of the rust, which we find on the apple leaf itself. The yellow spots which may cover the entire upper surface of the leaf, usually appear in June, here in Ohio, while the aecidial stage does not make itself known until a month or six weeks later. It is the latter stage which furnishes reinfection for the conifers.

Considerable loss of foliage is the final result from an attack of Cedar Rust. The apple trees closest to the diseased cedars, seem to be the greatest sufferers, altho these spores may be carried for miles. The writer noted a peculiar example of this spreading infection last spring, while in southern Ohio. A red cedar was standing by the roadside, on either side of which there was an apple orchard. This evergreen had a great many "Cedar Apples" and was acting as a source of infection for that locality. A definite circle could have been cir-

cumscripted around that tree for a center, for the closer you approached it, from either side of the road, the more noticeable was the infection upon the apple trees. The foliage revealed that, yellow, spotted, unhealthy look and the fruit also showed considerable infection, besides being small and inferior in every way. This was during the month of July and some of the trees were beginning to shed their leaves.

The Rome Beauty seems quite susceptible and the York Imperial is quite often attacked, as well as a number of other varieties. There are some so called resistant varieties of apples but a great deal seems to depend upon other conditions, as to the proximity of cedars, etc.

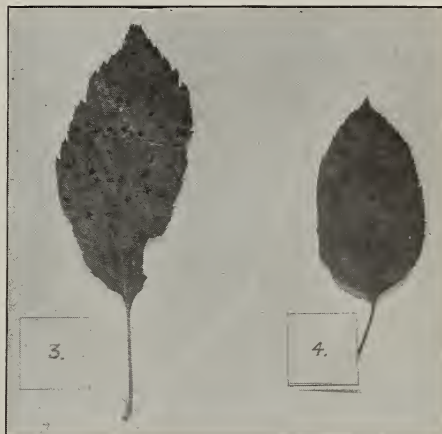
Treatment for Apple Rust.

It has been said that spraying will not give satisfactory results, but recent investigations carried on in West Virginia, by Giddings and Neal, seem to indicate, that if the spraying is done at the right time and under the proper weather conditions, the apple rust can be almost completely controlled. Bordeaux mixture, lime sulphur and atomic sulphur have been the fungicides employed. Here in Ohio we use simpler means of control, namely, the destruction of the cedar tree, thereby breaking up the life cycle of the rust. In a State like West Virginia where the cedar timber is probably as valuable as the apple crop, this way of combatting the fungus would not prove practicable. Spraying for this disease would not be profitable here in Ohio, for these trees are not so abundant and it simply means one crop or the other. The applications have to be made at the "right" time and during "proper" weather conditions. This would prove a difficult task where there is a large acreage to be sprayed.

The Apple Scab, (*Venturia Pomi* (Fr.) Wint.)

Here we have one of the most persistent and serious apple foliage troubles. This season there were serious outbreaks in different localities in Ohio, particularly in the southern section of the State. In spite of thorough spraying with various fungicides, the leaves of Rome Beauty and other susceptible varieties were covered with scab.

The spot which it forms on the upper surface of the foliage, is quite distinct from either of the above, being characterized by an olivaceous, velvety, black color or irregular outline. (See



No. 3—THE CEDAR APPLE RUST.
No. 4—THE APPLE SCAB.

figure four.) It gives such areas a somewhat roughened appearance due to the mycelium breaking thru the cuticle. Spores are abundantly produced which serve partly as a means of infection for developing fruit and foliage. It is not uncommon to see leaves so badly scabbed that they have become distorted and otherwise irregularly developed. After a somewhat short and partially functionless life they fall to the ground where they continue to cause a disturbance. The leaf surface of such a tree is consequently reduced before

the end of the growing season, thereby cutting short the food supply for the maturing crop. The fungus which remains on the foliage undergoes a further development during the winter months.

If a microscopic examination is made of the foliage which has wintered over and which was previously attacked by scab, one is liable to find the ascus or perfect stage of this fungus. The spore sac and conceptacle in which they develop are visible and it is this resetting spore stage which starts infection as soon as the young apple leaves unfold in spring.

The fungus as it occurs on the fruit is too well known to be described in this article. The "early drop," or the lack of the fruit to set, may often be due to an attack of apple scab. This last season many an apple orchard was defoliated long before its natural time, on account of this foliage disease. The weather conditions are an all important factor with troublesome outbreaks, as can be seen in making a study of last season's conditions. Here we have an example where a cold, wet, spring and summer are most favorable for its detrimental development, this is not the case with the great majority of our fungi.

Treatment for Apple Scab.

Again we have a case where clean cultivation would help materially in checking the disease. In the writer's estimation it would pay to burn over the sod which is harboring the infectious material, if an epidemic is anticipated.

Generally very satisfactory results are gotten by spraying, but this last season seemed to be an exception to the rule. Notwithstanding the fact that the spraying operations were carefully

planned and carried out, the scab made itself very conspicuous, much to the discouragement of the orchardist. Bordeaux mixture (standard strength), is probably the best fungicide which we have for the first application. This should be given as soon as the leaves unfold and before the blossoms begin to open, for this is the real "scab spray." It is not wise to use the 4-4-50 strength after this first spraying, on account of the injuries inflicted upon the fruit and foliage. If the copper solutions are to be employed, they should be used in a more dilute form, either a 2-2-50 Bordeaux, or the iron sticker spray seems to be of value in some cases.

It seems to be a well established fact that the so called "russetting" of fruit is brought about by the copper compounds being used for the sprays immediately following bloom, therefore the lime sulphur solutions serve as a substitute. It should be remembered that the application of these fungicides act as a preventative rather than a cure, which is the general rule to be observed when fighting fungous enemies.

Spray Injury.

Injuries produced upon fruits and foliage are not uncommon, but only such as occur upon the latter will be mentioned here.

If the lime sulphur is used in too concentrated a form, we may expect this marginal injury, because the liquid collects at the lower edge of the leaf and there it condenses, killing the tissues. This causes a dwarfing of the foliage and an irregular, one sided development.

"Experience is the best teacher," therefore it behooves us to follow the directions of the successful, and profit by our own mistakes.

Sweet Peas

PROF. L. M. MONTGOMERY
Horticultural Department

ONE of the most popular greenhouse florist products is the winter grown sweet pea. The culture of this crop has increased with great rapidity during the past decade and gives promise of continued development in succeeding years.

History.

The sweet pea is a member of the same family as our common garden pea, *Pisum sativum*, but belongs to a different genera—*Lathyrus*—and is scientifically styled *Lathyrus odoratus*.

Its history has been traced back into the 17th century. Sicily is credited with the nativity of the original purple and white forms, while Ceylon is mentioned as being the source of the so-called, Painted Lady, a pink and white form, and the original red out of which have arisen our crimson scarlet varieties, though her honors are protested by Curtis, Secretary of the National Sweet Pea Society of England.

An Italian monk, Franciscus Cupani is recognized as the original cultivator of this beautiful flower, and was instrumental in introducing the plant into England at the beginning of the 18th century.

Sweet Pea seed became known commercially as early as 1730, but it was not until the latter part of the past century that any considerable improvement began. Among the pioneer sweet pea breeders was Henry Eckford of Shropshire, England, who in 1876 undertook extensive experiments, looking to the improvement of the sweet pea blossom. His efforts were not at first appreciated, but about 1890 his success was rewarded by public approval.

Up to 1898 he had introduced 75 new

varieties developed by careful system of crossing and selection.

The Spencerian type with frilled or wavy segments was introduced in 1901 by Silas Cole, gardener to Earl Spencer. The seed stock of this type was transferred to this country and was extensively propagated in California, the state which has since become the chief source of seed for all commercial sorts.

Culture.

The sweet pea is comparatively easy to grow in the open or in the greenhouse. The best success is attained in the greenhouse because conditions are more subject to control by the grower and the demand for the blossoms is remarkably good at remunerative prices.

The four most pertinent factors in the production of the sweet pea are, soil, sunlight, temperature, and the control of insects.

Soil.

The sweet pea is essentially a cool climate plant and thrives best under those conditions of soil and atmosphere which naturally prevail during the late spring and early summer months. The soil requirements center about three qualities: 1st, fertility; 2nd, good drainage; 3rd, low temperature. Soils for sweet peas must contain an abundance of plant food. This may be best provided in the major part by the use of composted barnyard manures to which a small amount of acid phosphate, or lime phosphate has been added. Very little nitrogen will be required other than that which the plants obtain from the manure and the bacteria inhabiting the little nodules on the roots. The use of liberal quantities of lime will be beneficial in heavy soils and those hav-

ing a tendency towards acidity, especially in case acid phosphate is used with the manure.

Proper soil temperatures are provided in ground beds in the greenhouse. Raised benches will not give satisfactory results, because the soil will get too warm, dry out rapidly, and will not be deep enough to supply necessary space for root growth. The added expense is also a considerable disadvantage.

Sunlight and Temperature.

These two factors are almost inseparable in the influence upon sweet pea culture. The greatest abundance of sunlight is an absolute essential, but high temperatures are fatal. Houses for sweet pea culture should extend east and west and be of the even span type with the long span to the south in order to admit the greatest amount of sunlight. Excellent results may be obtained, however, in houses of other types. The house should also be relatively high in order to provide more light and permit of a better control of temperature through ventilation.

The right temperature in the greenhouse should range between 45° and 50° F. at night; near 56° F. on cloudy days and between 60° and 70° on bright sunny days. Provide plenty of ventilation at all times, but avoid cold draughts of air.

Control of Insects.

The most troublesome insect pest will be the aphids or plant lice. These must be controlled by other means than fumigation after the plants begin to bloom as the odor of tobacco smoke clings to the sweet pea blossoms for several days and renders them unsalable. Some form of nicotine sprays is commonly used after the blossoms begin to form.

Diseases.

The "damping off" fungus occasions

a disease which sometimes causes serious trouble on wet undrained soil. This disease is characterized by the decay of the stems near the surface of the soil and is induced by improper soil conditions.

Mildew is a superficial disease affecting the leaves and blossoms. Care in keeping the atmosphere relatively dry and the avoidance of draughts will give control of this enemy. In the event of serious trouble a solution of sulphur painted on the pipes will ordinarily give control.

Method and Season of Seed Sowing.

The seed are sown in shallow trenches extending north and south at a distance of at least four feet. The seed should be planted thinly, and after the seedlings are well started, thin to 3 or 4 inches apart.

The time of seed sowing will depend upon the season when the bloom is desired. From two to three months, according to season, will be required to produce blossoms.

Seed sown in October will yield blossoms from the holidays to June.

Training.

When the plants are about six inches high provision must be made for some sort of support. Heavy cotton cord is the most suitable material for the support of keeping the plants erect.

A Tribute.

The following quotation from Rev. W. T. Hutchins ably expresses the well merited appreciation due this beautiful flower. "The Sweet Pea has a keel that was meant to seek all shores; it has wings that were meant to fly across all continents; it has a standard which is friendly to all nations; and it has a fragrance like the universal Gospel; yea, a sweet prophesy of welcome like everywhere that has been abundantly fulfilled."



Picturesque Ohio---III.

HOLLIS KIGHT

THE fertile valley of the Walhonding offers as many coveted opportunities for the camera in search of artistic scenes, as any section in Ohio. Here are "peace and profound harmonies." The hills, meadows and the winding stream, all of historic as well as scenic interest, present pictures of rural life not to be forgotten. Among the most successful out-door workers with the camera is Mr. C. H. Hay of Coshocton. His admirable study of cows and pasture at the head of the present article is one of the most attractive of his many views in the section of the state which it idealizes and gives a fair conception of the beauty of pastoral scenes in the Buckeye state.

The belief is not uncommon, especially among those who dwell in the hills, that a flat landscape is artistically stale and unprofitable, as well as flat. This hasty and ill considered judgment is far from the truth. The fact is that a broad expanse of low country has certain charms, from the very nature of things, not possible among the mountains, in the hills and amidst the undulating verdure of rolling ground. The hazy effects of earth and sky often peculiar to a flat landscape are not to be

found elsewhere, and certainly there is a distinct charm about forest verdure which stretches away in labyrinths of trees, without reaching any elevation. These are some of the charms of many scenes in Franklin county, Ohio, which is certainly not noted abroad for great physical attractions.

Some of her forests are virgin ground, so far as the tiller of the soil is concerned, although the woodman's axe has thinned the primeval forest to the characteristic beauty of a grove. Incidentally it may be observed that no part of the globe offers a greater variety of trees than is to be found in almost any half day's journey in Ohio.

Muskingum river scenery will always be famed among the travelers of all nations. Its praises have been sung in prose and verse by many lovers of Nature whose names are familiar in the literary and artistic worlds, as well as by the vast army of others not so competent to describe the natural charms which they are nevertheless able to keenly appreciate. It will never be necessary to offer any apology for expressions of admiration of Ohio's River scenery, or of giving the world frequent evidences of its beauty, as in the



SHIP ROCK, ROCKY FORD CREEK, BAINBRIDGE, OHIO.



"A WINTER SCENE," NEAR ST. MARYS, OHIO.

present instance. The illustration herein is from a photograph by Mr. A. H. MacDonald of Zanesville, one of the most enthusiastic camera experts to be found anywhere and a devoted admirer of the river so long familiar to him. Mr. MacDonald recently made a launch trip from Zanesville to Marietta, taking views along the way.

A famous landmark is "Sentinel Rock," a towering giant's finger standing guard amidst the caves of Highland county. This remarkable formation is rightly named, for it has done sentinel duty among these hills from time im-

memorial. It is famed in Indian lore and has always been the subject of the white man's veneration, both from its legendary interest and the beauty of the scenes it looks down upon. The rock formations in this part of Ohio offer many of the most picturesque and unique studies of nature's eccentric mood to be found in all the expanse of America's scenic beauties.

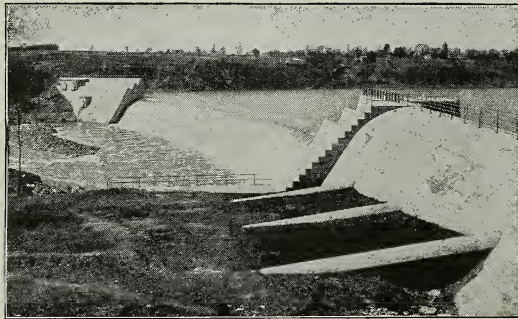
The genius of the engineer meeting the emergency required by a great city's demand for an adequate water supply, has resulted in the artificial creation of some beautiful river scenes

on the Scioto river some miles above Columbus. The construction of the great Jeffrey storage dam across the Scioto gives a waterfall of thirty feet across several hundred yards, and results in widening the river above as to make its scenery vie with that of the Merimac or Muskingum. The dam itself is an imposing structure. Its construction adds materially to the rural beauties of Franklin county.

Many picturesque scenes may be enjoyed by the wanderer along the banks of the St. Mary's river, whose peaceful flow, never great enough to be impressive, nevertheless plays an important part in many lovely landscapes. The winter scene shown in the accompanying engraving is from a view just outside of the town of St. Marys and is a fair example of the river's attraction during the period of ice and snow thru-out its course.

Rocky Fork Creek, near Bainbridge,

Ohio, traverses many of the wildest scenes to be found on Buckeye soil. The accompanying picture of "Ship Rock," perhaps the most noted formation along this stream gives abundant evidence of the peculiar tricks which nature has played along its banks. "Ship Rock" from a short distance stands out like a veritable battleship with the waters dashing over its bow. It seems to have almost the exact shape of an armored cruiser, the trees and underbrush upon its crest carrying out the effect, as if they were masts, turrets and guns of the vessel. The name given the formation must have been readily conceived, for it would immediately suggest a ship to any person who had seen one. The stream is full of huge boulders at this point and held in check by high cliffs of solid rock. It is a most romantic and beautiful spot, strikingly indicative of the varied beauties afforded by Ohio scenery.



WHERE COLUMBUS' WATER IS STORED.

Sheep Shearing Festivals

JAMES F. WALKER, '14

AMONG the numerous public gatherings which were common among the country folk of the olden days were the sheep shearing festivals. These occasions were somewhat social as well as competitive in their nature and grew into great popularity in sheep producing communities in the central states during a period from about 1860 to 1890. Merinos were in great popularity during that time and the chief object of the shearing festivals was to give an opportunity for breeders to show their sheep and to have the fleeces of heavy producing individuals removed and weighed in public. These occasions developed keen interest, marked great rivalry in the art of shearing, and proved to be a valuable advertising scheme. In 1865 the Ohio State Board of Agriculture aided the cause by offering prizes for heavy production, and it is recorded that at a shearing held at Newark, Ohio, that year, 53 rams produced fleeces averaging 13 pounds and 9 ounces each. In 1883 the Michigan Merino Sheep Breeders' Association held the first of a series of shearings at which time 41 head of sheep were shorn. Among the number was one that clipped an unwashed fleece of the very unusual weight of 41 pounds and 3 ounces. Another exceptional record was made in 1890 when a breeder had 7 rams to produce fleeces averaging 35 pounds 13 5-7 ounces each. With an increase in the popularity of coarse woolled sheep and changed conditions in rural communities these shearings have virtually passed from history. The farmer of the modern day seems to have lost a taste for such occasions although there is no real reason why

they should not be as beneficial now as formerly.

Prof. Charles S. Plumb seeing the great need of more intelligence in sheep shearing operations, and perceiving the benefits to be derived from congregating a large number of breeders in the interest of any cause intimately related to their business, conceived the idea of holding shearing contests in connection with the animal husbandry work at our agricultural colleges. The idea was an entirely new one and its success remained to be proven by experiment. While connected with Purdue University, Prof. Plumb on several occasions carried out this idea with some success, and since his removal to Ohio State University in 1902 he has directed six annual shearings. Time bids fair to make these occasions a permanent feature in the Buckeye state and the plan has proven itself to be as valuable as it is unique. Many men who own sheep are not well qualified for their duties when it comes to the matter of handling shears and of caring for wool, and many of the younger generation have never had an opportunity to see work of this kind done by experts. The events are therefore educational as well as competitive although all the benefits cannot all be classed under either of these heads, as the spirit developed on these occasions when professors, owners, shepherds, manufacturers, and students meet on common ground, is one that will do much to aid Ohio in maintaining her prided reputation as a wool producing state.

An account of this year's contest, which occurred on April 10th, will give a more adequate idea of what

takes place at these times. Early in the forenoon sheep men gathered from various localities. Well known men in the sheep world were there to act in official capacity. Prof. W. C. Coffey, in charge of sheep and wool work at Illinois University, Prof. E. L. Shaw, specialist in sheep and wool of the United States Department of Agriculture, and Mr. J. W. Hammond sheep and wool expert of the Ohio Agricultural Experiment Station, acted as judges in the various events.

The sheep used were all owned by

firms and individuals interested in the sheep and wool business.

Event 1—Shearing with hand shearing machines (Each contestant must have had same previous experience with a machine.) 1st prize, \$5.00; 2nd prize, \$4.00; 3rd prize, \$3.00; 4th prize, \$2.00; 5th prize, \$1.00. Winners—T. R. Price, Radnor, 92 points; Wendell Beebe, Delaware, 88; G. A. Shaw, Marengo, 85; F. E. Beebe, Delaware, 83; J. F. Parthemore, Marengo, 82.

Event 2—Shearing with power machine (open to any one qualified to



BEFORE SHEARING.

the University and included both coarse and fine woolled types. The scale of points by which the work was judged is as follows:

Quality of shearing.....	25 points
Number of cuts.....	10 points
Handling sheep	25 points
Speed in work.....	20 points
Handling shears	5 points
Tying fleece	15 points

Perfect score100 points

The different events and the results of each are listed below. The prizes were offered through the generosity of

enter No. 1.) Prizes were the same as in Event 1. Winners—G. A. Shaw, 92 points; Wendell Beebe 87, F. E. Beebe 82, J. F. Parthemore 80, J. R. Lucas, Pataskala 75.

Event 3—Shearing with hand shears. (Experienced shearers only.) 1st prize, \$5.00; 2nd prize, \$2.00; 3rd, 4th and 5th prizes, \$1.00 each. Winners—G. A. Shaw, 94 points; F. E. Beebe 92, C. V. Harden, Millersport, 90; J. R. Lucas 82, J. F. Parthemore 80.

Event 4—Shearing with hand shears by a boy or girl not over 16 years of age. 1st prize, \$3.00; 2nd prize, \$2.00;

3rd and 4th prizes, \$1.00 each. No competition took place in this class but Wendell Beebe was announced champion boy shearer, having won two prizes in competition with the men.

Event 5—Exhibition work on power shearing machine. In this event an Australian, Mr. M. E. Smith, representing the Chicago Flexible Shaft company, endeavored to break the world's record for shearing a sheep which was established at St. Louis in 1904, the time being 1 minute 31½ seconds. Mr. Smith did not lower this standard but made a most creditable showing by clipping a Cheviot wether in 2 minutes and 3 seconds. The best time on a hand machine was 4 minutes and 35 seconds made by F. E. Beebe in Event 1.

Event 6—Handling and tying the fleece. (In this event each contestant was required to shear a sheep and then tie up the wool in the presence of the judges.) 1st prize, \$8.00; 2nd prize,

\$7.00; 3rd prize, \$5.00; 4th prize, \$3.00; 5th prize, \$2.00. Winners—G. A. Shank, Pataskala, 98 points; George M. Deeds, Pataskala, 97; Ed. Mahoney, Wilmington, 96; C. V. Harden, 95; J. R. Lucas 92.

Other years there has been an event for students. This is a part of the program which should not be omitted in coming contests as aspiring young shepherds should have a chance to practice as well as to look on.

Predicting the future from observations of the past it would seem that much success was in store for coming shearing festivals. Men are beginning to realize that a rally of this nature should not be missed, and as time goes on the contests will no doubt serve as more and more of a nucleus for sheep men from all parts of the state. In fact it is not improbable that breed associations will take notice of these events and plan to make some of their meetings center around the shearing. The future is full of possibilities.



AFTER SHEARING.

Work of a Biological Survey

PROF. HERBERT OSBORN
Department of Zoology

IN view of the organization of a Biological Survey for Ohio the question as to the particular work to be accomplished by such a Survey is a legitimate one. While it will be hardly possible to cover in a brief article the various phases of work that are contemplated in such a Survey, I will attempt to summarize briefly some of the more important lines which have been under consideration in the starting of this project. In the first place a Biological Survey is intended to secure the knowledge concerning our state fauna and flora that is urgently needed by all teachers of Botany or Zoology in the state, to enable them to give accurate information concerning the plants and animals of their localities. The urgency of this need is perhaps not realized by those unfamiliar with the situation, but if it be remembered that there has never been a complete survey of the Biology of the state, and that for the use of students or teachers in these subjects the work done in adjoining states has to be resorted to for many of the necessary facts, it can be seen that there is a positive need in this direction. It is evident that this knowledge once acquired and published in form to be available to all can be applied in a host of different questions and while sought primarily for the purpose of instruction is available for any practicable purpose. Some of the most evident of these are, for the use of the Fish and Game Commission, the State Board of Health, City Boards of Health and the Agricultural Experiment Station.

For example the Fish and Game Commission needs accurate informa-

tion concerning the plant and animal life of the fields, forests and various bodies of water in the state, for the purpose of enforcing the laws against the taking of certain kinds of fishes or the killing of game or of birds or of other animals protected by law, and also for the purpose of properly stocking the lakes and streams with suitable fish. It is evidently a distinct waste of effort to stock such bodies of water with large numbers of fish unless there is a supply of the proper food for them to live upon, or if other kinds of fish or aquatic animals are in such numbers as to make their growth impossible. Without this knowledge the work of the Fish Commission, however faithful it may be, must be largely guess work and lack the efficiency which would be possible with positive knowledge.

In the work of the State Board of Health and the City Boards of Health there is a distinct need of accurate knowledge concerning the occurrence and distribution of such animals as may serve in the transmission of infectious diseases, a necessity which is coming into recognition very much more forcibly since the work of the last few years has shown such close relationship between disease transmission and certain kinds of insects. It is now known that many diseases depend for their distribution on such animals as flies, mosquitos, ticks, fleas, etc., and accurate knowledge of just what species of these carriers are to be found and where they are to be found in the state is necessary.

For the purpose of Agricultural development there is still much need of

the accurate knowledge of plant and animal distribution, and such information is perhaps most strikingly desirable for portions of the state which are not open to the more common methods of culture. The utilization of waste land, hilly tracts, river valleys, marshes, swamp and over-flowed land is largely depended upon a knowledge of the life which can most successfully grow in such localities, and the information which can be contributed to these by a careful Biological Survey will certainly go far toward solving a number of the difficult problems in such conversation and utilization.

In connection with these purposes it is the intent to publish as rapidly as possible Bulletins which will contain descriptions and illustrations that will serve for identification of plants and animals in the state, and to add to this service the identification by experts of specimens that may come in from those who are desirous of getting information. Such work will serve a double purpose, that of giving information where it is desired and of supplying material on which the Survey can base its work upon the distribution of different species in the state. It is also proposed to furnish as soon as possible identified sets of specimens for

the use of Colleges, High Schools, or rural schools that may desire them as a basis for the recognition of the plants and animals occurring in the locality. In short to do a phase of extension work now often demanded and which is possible only with a reserve of carefully identified material and the assistance of specialists in many different groups. The extent of the service may be appreciated better perhaps if it is understood that already more than a dozen Colleges are cooperating in this work, and some twenty-five or more individuals, who are specialists in particular groups of plants and animals have offered their assistance in carrying on the work.

The extent to which the Survey can take up and push studies in different parts of the state will depend necessarily upon the support which is given the project, and it is expected that state aid will be forth-coming as the need becomes more apparent. However, the work may be inaugurated and considerable progress made with small expenditures of money, and there is little doubt that the work will grow. It is plainly evident that the problems to be studied in this line are sufficient to require attention for many years to come.

Just whistle a bit if your heart be sore,
'Tis a wonderful balm for pain,
Just pipe some old melody o'er and o'er
Till it soothes like summer rain.

Paul Laurence Dunbar.

Conditions Necessary for Co-operation

RAY BERLIN HUGUS, '13

IN so short a paper I can only speak of one of the phenomenal successes which has been made by cooperative methods among fruit growers. I hope this example will show us the conditions which must exist to bring about successful cooperation, since they are the same in all cases. But before beginning let me sum up the causes for co-operation among men, in the one word—**necessity**.

One of the most striking successes of cooperative methods among fruit men has been accomplished by the Citrus growers of California. In order to see how this was brought about, let us go back to the beginning of the industry in California and study the conditions as they developed.

As is generally the case in a new industry, the men who are in the business first reap easy and phenomenal profits. So it was with the pioneers in the citrus industry in California. They carried off prizes which have never been equaled or even approached. They paid for their orchards and became rich from the proceeds of a few crops. The large fruit concerns of the country competed with each other to get these small and valuable crops and prices were boosted to the record height. Now, let us watch the effect of this cause. The young men began to dream of owning orange and lemon ranches. They spent their leisure time in figuring out the best way to spend their first million, which they were presently going to make growing citrus fruit. And they not only dreamed but they planted. Thousands of acres of oranges and lemons were set in a few short years. Everybody who could get capital together and find a piece of land went to

planting. They were going to get rich quick and they all went about it in the same spirit of "Everybody for himself and the Devil for the hind-most."

Gradually these thousands of acres began to bear. Those which came first made good profits for their owners. The fruit soon piled up on the hands of the buyers and they ceased to compete for the products of the orchards. These wise old foxes knew what was about to happen and began to cut prices. There was enough for all and they knew it, and ceased to worry about where their fruit was coming from. Just at this time of course everybody was contented. Prices were fair to grower and commission man and each was making money. Now, let us see what happened when the greatly increased crop of the next year came on the market. The commission men were looking for it and they sat back and began to enjoy the grand scramble among the producers to find buyers. They were all wise and knew what would happen if they did not appear too anxious to pay high prices, and it did happen. The grower, after being turned down by a dozen different middlemen found it necessary to accept whatever the buyers felt like paying. They were all in the same boat and were all scared. They acted just as men always have acted. When they came face to face with something which they could not understand, and from which they were likely to suffer, they began to pray. They were all selfish so they prayed alike.

"Dear Lord, bless me and my wife,
My son John and his wife,
Us four and no more."

Then what happened. The Lord got disgusted with their selfishness and

lowered the price of citrus fruit. By the next year, with an immensely increased bearing acreage and a record breaking crop, the commission men were enjoying the show immensely. They couldn't handle all the fruit and they went about advertising the fact among the growers.

At the end of the season even those who had been able to dispose of their fruit found on closing up their books that they had not made enough to pay expenses. This was too much for the poor fellows and again they became humble.

"Lord—Lord—what shall we do to inherit the kingdom of citrus fruits?"

Now let us notice what happened. The Lord took compassion on them and sent among them a prophet who spoke as one having authority, and said, "Know ye not that the Lord sayeth, 'Do ye one unto another even as ye would that he should do unto you.'

Get together, men, get together."

The California citrus growers had learned their lesson, at least in a practical way, for they began to get together. After many trials and much dispute and struggle, they found themselves united in 1905 in a body which they called the California Fruit Growers' Exchange. And wonder of all wonders they found that the Golden Rule was really workable and that there was enough for all. In the one year of 1911 the Exchange cleared for its members over three millions of dollars besides exerting a great influence in securing better car service and lower freight rates, holding up prices and increasing the market for citrus fruits. But what is more important to us than their financial gain is the fact that the California Fruit Growers' Exchange stands as a lasting and living example of the old proverb of—

"United we stand, divided we fall."



A SEAT ON THE CORN PLANTER IS OFTEN MORE STABLE THAN A SEAT IN THE SENATE.

The Canning of Fruits and Vegetables

J. T. MINTON

THE greatest problem of the farmer and fruit grower of today is the reducing or eliminating waste. Only in this way can he make a profit and it is because of this fact that thousands of dollars are lost to the farmers of this country. In fact no other industry could suffer the loss that farmers do and still continue in business. It is a fact that over fifty per cent of the natural production of the average orchard and garden are lost for food production. Many do save these wastes or rather prevent them but they are few when compared with the total and even these few are not getting as much profit from their produce as they should.

There is nothing new about canning. The same principles used today were followed forty years ago, but were always used by the large commercial canneries, and for some reasons the methods, until recently, remained somewhat mysterious. There is no reason for this as canning is very simple. All there is to it is the placing of the fruits or vegetables in receptacles, usually cans or jars, that can be sealed in such a manner as to exclude air, and then subjecting them to heat of sufficiently high temperature to kill the ferment germs or spores. These products will keep indefinitely. No chemicals are required for preserving, simply the application of intense heat for a definite period. The article must be kept away from the air or a fermentation or growth of spores will take place. Therefore the application of heat is the most important factor in canning.

Canners are divided into three kinds; the steam pressure outfit with the close

fitting boiler, hot water with open or closed boiler and hot water with open boiler. These different outfits for home use cost anywhere from \$5 to \$30 while the larger factory outfits cost up to \$290. The larger outfits are intended to handle large quantities of produce in a limited time.

Of the three types mentioned the steam outfit is the most expensive and probably the best for the following reasons.

1. The spoiling of food stuffs is due to the so-called ferment germs which multiply very rapidly. When these germs become active, fermentation takes place which renders the goods unfit for consumption.

2. The temperature of the water will not rise higher than 212° when heated in an open kettle and some of the germs that cause fermentation are not killed at this heat even after eight or ten hours boiling. This may not always be true but corn has been hard to can for this reason. Peas and beans are also hard to sterilize. If they are sterilized it is only after being put in boiling water for a number of hours and this requires too much time.

3. Steam under pressure raises the temperature to a much higher degree and will therefore sterilize quicker, taking at the most only half the time required by boiling water.

Before canning most fruits and vegetables should be parboiled. This is necessary because of the presence of certain acids. These acids do not cause fermentation, but they cause the goods to become musty and unpalatable if they are not removed. This blanching is done by boiling the vegetables for

a short time and dipping them in boiling water before placing them in the cans.

Vegetables are then placed in the cans and the air exhausted. This is done by leaving a small vent hole in the cap to allow the air to escape, then stopping up the hole and putting the can back to process. Many commercial canners do not use the exhaust methods. It takes a gallon can of tomatoes about a half hour to be processed at 240° F. and about 75 minutes at 212° F. The usual can for tomatoes

is the No. 3, which weighs about 32 oz. This should be processed at 240 for 15 minutes. These cans cost from \$11 to \$18 per thousand. Syrups are used in canning fruits. This does not add anything to the keeping qualities if properly sterilized. These syrups are made by using one and a half pints of sugar to one pint of water. Western canners using this syrup have more demand for their products than do the eastern concerns who use one pint of sugar to one and a half pints of water.



COMMERCIAL CANNING ON A SMALL SCALE.



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COLUMBUS, OHIO, MAY, 1912.

Editorial

The man, who can in the midst of the strenuous life of our countryside, keep ever before him the vision of rural betterment and uplift, is the expression of real manhood. He will be the nation's backbone. He must be a man of courage, of strength and of conviction. His moral and religious life must be pure and he must have the courage to follow the dictates of his conscience. A public office would be to him a public trust and selfishness should be foreign to his nature. The high moral standards that were so sacred years ago should be proudly and triumphantly borne by him. The higher and nobler things of life should be dear to him. His vision must be broad, his mind clear and he must have a true preception and appraise things at their real value. Yet, withall, he must be able to sympathize with his neighbors and live with them so as to impart to them

the vision of "Rural Betterment" that he has seen. Such a leadership is what is needed in our rural districts.

One of our Professors struck the key note recently when he said in substance, that the greatest **COOPERATION** problem of the farmer was not so much the task of economic production but rather that of economical distribution and selling. If you are selling apples at thirty-five cents a bushel and it costs thirty cents to produce them—and if by spending ten cents a bushel more you can get sixty cents for them, obviously the latter is the more profitable. If farmers can have men handle their products so as to get them to the right market in the best condition and at the proper time their worries about profits and losses will materially be lessened.

Other states have well developed co-

operative organizations. Ohio is yet in her infancy along this line. It behooves our leaders to take the initiative in this and show the farmers some of the profits accruing from co-operative buying and selling. Get in line, men, study the problem—the greatest before the American farmer.

“Long about this time o’ year,” as the poet has said, the student must fill out his class card for next

ENGLISH year. Now we hope no one will construe this as a

VS. knock on the modern language course. Far from

it. We refuse to be drawn into that struggle editorially. But we do want to call the attention of the underclassmen to the woeful lack of the ability to handle the Mother Tongue by many of our students. Agriculture as a science and a business has grown by leaps and bounds within the last few years. Mr. Student, you will receive constant calls to write and speak on some subject relative to your business. Why not be well prepared for that work? Numbers of college men have gone out handicapped by the inability to tell what they know. The men who have received the most desirable positions at the highest remunerative prices were those men who could express themselves clearly, fluently and accurately.

It is a sad fact—but fact nevertheless—that so few of our Agricultural Students take more than the required amount of English. ’Tis useless to point out the necessity for a good command of the English language or the many joys and privileges to be derived from a complete mastery of it. No matter if you must take a course in French or German—do as others have done and take a course in English also.

Sign up for some advanced English even if you do have to stay up an hour or two writing themes or perchance must forgo a course in Agronomy or Steer Feeding. ’Tis well to link together **gentility** of the farmer with **fertility** of the field. Knock off a few of the rough corners, polish up your society manners, then boost and lift agriculture to the plane where it was first intended to be—the noblest and best on God’s green earth.

Not long since the western farmer was burning his corn because the freight was more than

WATCHMAN, he received for it.
WHAT OF Too, the sheepman was
THE NIGHT? killing and giving away his sheep and

the dairyman was selling eight cent milk. ’Twas but recently that the price of all farm produce was so low that the farmer could scarcely keep above want. Then no one seemed interested in the farmer, his family or his welfare. But behold! Now that he is coming into his own, is receiving fair prices for what he produces and is beginning to find and to fill his real station in life there is a change. Every pseudo-reformer, every theoretical worker, all organizations from the highest department in the nation to the humblest charity and social department of the city feel duty bound to reform him and teach him the errors of his way. Some come out in the open with wonderful and strange theories as to what “We” will do for the poor downtrodden farmer. Others work more subtly, yet their work is none the less certain. Still the farmer seems to withstand it all, even to the legislators who constantly insist on passing such laws as will kill the very business that is at the foundation of the country’s prosperity.

The action of our recent and present legislative bodies amply demonstrate the fact that they will do something. What, they know not, and often seem not to care. Yet do, they must!

Young man, farmer, student, instructor, Agricultural leader and college graduate awaken to your needs. Watch your lawmakers. Look well to your laurels ere it be too late when you awaken and cry "**Watchman, What of the Night?**"

"The Student" has just received the first copy of two new College Agricultural magazines, viz., **WELCOME.** "The Clemson Agricultural Journal," published by the students of Clemson College, South Carolina," and the "Journal of Agriculture," published by the students of the University of California. The Clemson Agricultural Journal is a special corn number, while the Journal of Agriculture is more of a general issue. They are both excellently gotten up and are well illustrated. We most

heartily extend to them the glad hand of welcome and wish them a pleasant voyage down the stream of Agricultural Journalism.

We are indebted for the beautiful frontispiece in this issue to the Tannenbaum Farms,

ACKNOWLEDGMENTS. May & Otis, proprietors,

Willoughby, Ohio. The poem, "Go Plant a Tree," was written by one of the old patriarchs in the horse realm, viz., Wm. B. Powell, of Shadeland Farms, Shadeland, Pa., who died March 30, 1913. As the new management is gradually assuming control of "The Student" they wish to thank the many friends, subscribers, contributors and supporters of the past and ask that they continue to give their support and influence during the coming year. It is indeed a big task to get out a paper that will do justice to Ohio State, nevertheless we will do our very best to publish during the coming year a paper that will be a credit to our college.



CURRENT AGRICULTURAL LITERATURE

COMMENTS AND CRITICISMS ON
CONTEMPORARY CONTRIBUTIONS

Dr. E. M. Santee has recently published a little book on the important subject of "Farm Sewage." In it he has considered, in detail, the septic tank with its inlet, outlet, location, etc. The dimensions of a tank for a family of six, the materials required for building, the plan of procedure, and cost are all given. Orange Judd Co., cloth, net, 50 cents.

The Florists' Manual by William Scott is one of the recent and the most complete books concerning this phase of horticulture. It is very concise, clear, and fundamental from cover to cover. It is profusely illustrated with the best of photographs. The book is the result of practical experience and the subject is handled in a clear and concise manner. The high points are hit in a logical order which will enable the beginner to easily grasp the subject. Florist Publishing Co., Chicago, Ill. Cloth, net, \$5.00.

"Decline of Our Agriculture." This is the title of an article set forth in the **Literary Digest** of April 12. It cites the **London Times** as comparing the languishing of our Agriculture here today with the way it did in Great Britain a generation ago. Among the causes suggested are the lack of business methods and co-operation among farmers, love of luxury, and attractions of the city. It is further shown that the increase of value of farm produce is

due to a rise in prices rather than larger yields.

Joseph Wing has published an article in the **Breeder's Gazette** for April 12, relating to the management of our pastures. He mentions many facts regarding young pastures that should be heeded, together with the effects of early pasturing on stock. Some ways of improving pastures by manures, lime, and varied stocking, are given.

A condensed article relating to soil fertility, by J. H. Vorhees of New Jersey, appeared in the **American Agriculturist** for April 19. Mr Vorhees has set forth some essential points to be followed, together with a few things to be avoided. Commercial fertilizers are briefly discussed, and some combinations for cover crops are suggested.

"Making a Good Potato Crop," is the title of an article by C. G. Williams of the Ohio Station. It appeared in the **Ohio Farmer** for April 26. He covers the subject briefly and thoroughly, taking into account the soils best adapted to the raising of potatoes, rotations, cultivation, and spraying. The varieties best adapted for specific purposes are named, and the size, amount, and methods of handling the seed are discussed.

Director C. E. Thorne of the Ohio Station has written an interesting article which appeared in the **American**

Agriculturist for April 15. It is entitled "Handling Lands for Permanent Profit." He briefly contrasts the results of the methods of farming of olden days with the more enlightened modern methods. This is supplemented with a few results of each method. Commercial fertilizers and manure are discussed, and the way in which they were here used.

We have heard much of late regarding European finances and banking systems for farmers. We now have a commission abroad studying their conditions and methods, with the hope that upon their return, they may be able to establish systems here. **The Country Gentleman** for April 12, has published an article by Charles A. Conant, which sets forth briefly some methods now in use in France and Germany and how they were evolved.

Along the same line, Prof. C. J. West, of the Ohio State University, has written an article in the **Ohio Farmer** for March 19. He shows the shortcomings of our methods as opposed to the more lenient terms of European methods.

Read what Mr. Fred Eastman has to say in the March number of **World's Work** on the work of the Country Church. It is interesting in that it is the actual performance of a Country Church and its pastor who understood how to be of very great assistance in his community. He emphasizes the point that the duty of the Country Church is to help the farmer in every possible way instead of merely "holding meetings and taking up collections." Many Churches can doubtless follow the example of this one.

Prof. O. C. Cunningham has cleared up some of the mysteries in the minds of many who are unfamiliar with improved dairy methods, in the **Ohio Farmer** for April 5. In his article "The Truth about Milk Pasteurization," he explains in a popular way, the changes that have taken place in milk, and how they can be checked by heat. The difference between pasteurization and sterilization is carefully shown. The methods of handling milk during and after pasteurization are given in detail.

The soft green grass is growing
O'er meadow and o'er dale;
The silvery founts are bowing
Upon the verdant vale.

WITH THE BREEDER

NOTES OF INTEREST AMONG THE FLOCKS AND HERDS

Ohio sheep have gone all over the world and the Ohio cattle are winning a similar enviable reputation. The Western Reserve Holstein Breeders' Association has just sent a lot of ten head of Holsteins as a consignment to the Orange River colony in South Africa. These Geauga County men are making community breeding pay. The demand for their purebreds is constantly on the increase. Is it not time that other counties follow their example and help raise the livestock standards of Ohio?

Carpenter and Ross, of Mansfield, Ohio, recently completed one of their largest sales. They parted with several car loads of their choicest animals, including several bulls of national reputation. Success is certainly following their footsteps.

D. R. Hanna, a noted Shorthorn breeder of Ravenna, Ohio, recently held at Chicago a large sale of his herd which met with great financial success. Mr. Hanna has always been working to upbuild the Shorthorn breed by the production and distribution of a superior type of cattle. Admirers of the breed gave evidence of their appreciation of his work in furthering the breed.

A few days ago M. W. Savage, owner of the world-famous pacing horse, Dan Patch, created considerable com-

ment when he sold twenty-three pacing colts which are the get of Dan Patch for an average of \$1065 per head. The prices obtained from these young animals indicates that the production of well-bred horses is a very profitable enterprise.

The Sheffield Farm of Glendale, Ohio, recently purchased from C. W. Berry and Son, the Berkshire boar Robhood 17th. This boar stands unsurpassed both in individuality and breeding. He combines the best blood of the Silver Tip and Berryton Duke strains together with the blood of the best imported boar in America in the last decade. Indications point to the fact that he will develop into a boar of national reputation both as a breeder and show animal.

A. T. Sroufe, of Putnam Co., O., is endeavoring to have the farmers of his community breed heavy draft horses. Many of the horses which are now grown and fattened by Ohio farmers are bred in other states; Ohio could well breed more.

The city of Cleveland during the past week purchased 52 blue blooded Holsteins. This addition makes a total of 116 dairy cows which belong to the city. They are used to supply milk for the city tuberculosis sanitarium, the baby dispensaries and other city institutions.

ALUMNI WHAT THE BUSY GRADS ARE DOING

The various committees composed of alumni, faculty and students, who have in charge the management of the 40th anniversary celebration, report that the work is well under way. One who has not given this much thought or consideration, cannot imagine how great is the undertaking; how far reaching in its influence; how much it will mean for all who participate, either directly or indirectly and also the unseen benefits which will be secured for the University which we have learned to love so well.

Patriarchs from all sections of the country are planning to be present. Special class reunions have been planned as follows. 35th anniversary of the class of '78, 30th of '83, 25th of '88, 20th of '93. 15th of '98. 10th of '03. 5th of '08. In addition to these the classes of '87, '91, '02, '06, '07, '09, '10, '11, and '12, all promise to have a reunion and are faithfully working toward that end. The undergraduates are urged to remain for these few days of jollification and help form a closer union of fellowship between Alumni, faculty, student body and friends of the university.

The class having the largest per cent in attendance at their reunion, will be presented a loving cup. This cup is donated by W. H. Siebert, '91 and '95 and will be presented by T. E. Pomerene, '88.

The music for these few days will be furnished by the men and women's glee clubs, the university quartet and band.

A very brief outline of the program is given below:

Sunday, June 8th—Baccalaureate Sermon delivered by Rev. G. G. Atkin, '88, of Providence, R. I.

Sunday evening, vesper service on the campus, conducted by Dr. W. O. Thompson.

Monday, June 9th—Alumni day. Forenoon—Business meeting in chapel.

Noon—Alumni luncheon in Ohio Union for men, and in Women's Union for women.

Afternoon—Historical pageant, in which alumni, faculty and students will portray the activities of the University in all of the departments from the beginning, to the present time.

Evening—Society organizations and class reunions meet in the Ohio Union. Browning play given near the spring.

Tuesday, June 10th—Historical day.

Forenoon—Three addresses, along the line of historical reminiscences. Speakers to be selected.

Noon—Lap luncheon on the campus.

4 P. M.—Presentation of the loving cup, to take place at the spring.

7:30 P. M.—Alumni dinner in the Armory—Dr. Thompson will act as toastmaster.

Wednesday, June 11th—Commencement day.

Evening—Senior prom.

Note: This will be the real "Home Coming Week." Every Loyal Ag should remain over for commencement week in order to show what a great Agricultural College, Ohio State has.

Secondary Agriculture

Devoted to the Interests of Agricultural Education in High and Common Schools

In dealing with nature in our schools, we find that everything is so interesting we scarcely know where to begin. The field of study is so broad and comprehensive and there are so many possible lines of investigation for us—both as teachers and pupils—that we are oftentimes at a loss to know just which subject is the best. We have the fields of Agronomy, Dairying, Animal Husbandry, Botany, Zoology and Horticulture to choose from. All over Ohio last year teachers have been teaching some interesting phase of Agriculture. Some have been interested in “Buds,” some in “Insects” or “Domestic Animals,” and still others in “Weeds,” “Grasses,” “Grains,” “Vegetables,” “Flowers,” “Fruit Trees,” or “Forest Trees”—or in some subdivision of these topics. It is advisable that the instructor be familiar with and also thoroughly interested in his subject. Then intense interest on the part of the pupil can be awakened. Enthusiasm counts here as everywhere else. In agriculture, as in any other line of teaching, the personality and true interest of the teacher are of more avail than any cut-and-dried pedagogical method of instruction.

WEED STUDY.

When Agriculture was first made compulsory in Village High Schools last year, we were somewhat unprepared for it. The text books had not arrived when school began, so to create

an interest in nature and bring to the pupils' attention various common weeds, I asked them to collect a specimen of those that were most troublesome. With the aid of the Weed Bulletin from the Ohio Agricultural Experiment Station, Weeds of the Miami Valley, by Grace Kalter, a Bulletin from Miami University and other weed books were able to identify the specimens.

Each pupil pressed any twenty weeds and mounted them with court plaster on gray paper. I encouraged them to design a cover and required that they at least print on it, “Profitless Weeds” and their names. Many artistic and appropriate designs were made, some using thistle, artichoke, morning glory, clover, dandelion, wildrose, etc., and one pupil painted a landscape with rabbits running out of the brush. The pages were bound together with ribbon or clamps, so that they made a very neat appearance.

Besides this I assigned one weed to each pupil of the class for description. (The outline of this was very brief and was as follows: Common Name, Scientific Name, Date, Root, Stem, Leaves, Flowers, Seed, Habitat, How Exterminated. Remarks.)

After I had corrected this outline, they copied it in their Agricultural Note Book. Each pupil had a list of the weeds and the names of the persons who had described each. When their twenty weeds were mounted, they

copied and the description for each, from the person who had that special assignment.

This weed study proved very interesting and instructive, so I have pursued about the same plan this year, with the added work of finding the seeds of the pressed specimens. We were aided in identifying the seeds by a Weed Seed Collection, made by the Agricultural Extension Department of Purdue University, which I bought for

of some interesting work. Both teachers and pupils were in earnest and their object of investigation—"Weeds"—offers almost an unlimited field. Most of our troublesome weeds, both in country and city are foreign. A study of "Foreign Weeds" or "Native Weeds" would be both interesting and profitable.

The teaching of Agriculture in our public schools is of the highest import-



ART MAY ERR, BUT NATURE CANNOT MISS.—Dryden.

thirty-five cents when their Agricultural train stopped at Harrison last fall.

When State Inspector Ivens visited our High School, he suggested the study of poisonous weeds only, so I intend to vary the work next year in this manner, making a special study of the poisonous part and it's economic importance to man.

Zetta A. Huber,
Harrison High School.

The above is an interesting article

ance. A proper understanding of agricultural problems by all our future citizens will do much to make the farm life—the ideal life. We would again urge our readers to use these columns. If your school is successfully working out an idea, or if you know of any other school that is doing things along this line—let us hear about it—so others may be helped. Let's get together on this proposition! Let's try to make Secondary Agriculture Education in Ohio the best in the Union.

PREFOLIATION.

A few days since in conversation with a young lady attending a neighboring high school it was mentioned that she was studying Botany. Upon inquiry as to how they developed that subject she remarked that they had skipped the subject of buds till spring when they came forth. I remarked to her that we had just completed that chapter: she seemed surprised. I explained to her that our boys and girls had been instructed to bring twigs to school, put them in jars of water, to keep these warm and to give them plenty of sunshine, and that we found the study of buds easy and interesting in February.

That this should be new to any one familiar with nature seems strange, so I venture to elaborate further, hoping to help and to interest some one.

Twigs from the Horse-chestnut, Buckeye, Tulip, Carolina Poplar, Beech, Apple, Pear, etc., were brought. Perhaps the most interesting was the Horse-chestnut. The bud scales and sticky material were interesting and instructive.

Questions as to the uses of these were left with the boys and girls. Then the amazing discovery was the cotton-like substance within. What was it for? But the leaves! How small and snug they were! The magnifying glass was brought into use. They were instructed to proceed carefully and thoughtfully. Several other kinds of buds examined among which were the Buckeye and Tulip. The latter prefoliation is intensely interesting.

We have been watching these buds as they swell, burst open and come forth. The Horse-chestnut buds have made the most rapid progress. The leaves have come out: they are stretching out of their long cramped position

and are two to three inches long. How surprisingly fast they have developed! The veining of the leaflets, their margins and shapes can be distinguished. Many of our boys and girls had never noticed the Horse-chestnut; they did not know the difference between it and the Buckeye. But now since they have studied these buds they recognize the difference.

Our class is waiting for one thing, whether the blossom will come out. I think it will. Already we have peach, apple and plum blossoms and have seen and studied all the parts of their flowers.

A few days ago I cut off a part of a Horse-chestnut twig close to a dormant bud. That bud is now swelling and shows evidence of coming out. The wound is also beginning to heal. Yesterday I took forty-five minutes to explain the relation of buds to pruning. I cut off limbs and showed the pupils why a limb must be cut close to the limb from which it branches or cut close to a bud. I had a branch with examples to demonstrate all these points. These boys and girls see now that a bud is truly "a promised branch."

Now, what does all this show? We hear teachers say they cannot teach Agriculture or Nature Study that they cannot do experimental work. How misled they are. If they would only try. If they will only open their eyes they will find many easy things they can do, and these are just the things that count. I find nature study easy and enticing. It grows upon me. The longer I study it the more wonderful it seems. I find myself so much more resourceful. Every time I present something of this nature to boys and girls I find I have grown more in their favor. They like nature study.

In this particular case I take five to ten minutes at the beginning of each recitation to ask questions regarding observations the pupils have made. From these twigs we have studied prefoliation or the different ways leaves are arranged in different buds, branching, stems as to structure and functions, animal growths, leaf structure and work, osmosis, flowers with all their parts, pollination, pruning and tree surgery. It has brought out many interesting questions and discussions. The pupils have discovered many things for themselves.

To my way of thinking this is the way Agriculture and Nature Study should be taught. The method means much. Let us get next to nature in some unique way. Personally, I care little for a text book in the hand of the pupil. If I have reference books and a chance to get out and to bring nature in the laboratory I can accomplish many things. Let us get away from the text books at times and thus encourage independent study and observation on the part of our boys and girls. Science cannot be learned from the text book.

H. A. Phillips,
Supt. North Lima Schools.

The "Grasses" might be worked out with great pleasure and profit. Specimens of "Timothy," "Red Top," "Orchard Grass," "Broom Grass," "Kentucky Blue Grass," "Bermuda Grass" (wire grass), etc., might be collected, identified and studied. The different clovers—red, white, alsike, mammoth—open up another field for study. Alfalfa has a wonderful history which may be worked out in addition to the collection and study of specimens.

SWATTING THE FLY.

If flies were as large as horses we would not have a one in the land. Because of our indifference to them and their disease breeding and carrying activities, they inflict terrible damage and appear in countless numbers. It has been estimated that one pair of flies beginning in May, under favorable conditions, would breed 143,675 bushels of flies by September.

"Swat the Fly" is now an old war cry, and a good one it is too. A swat in time would save a million swats—in this case. But the very myriads of flies prevents their extermination by the swatting process. The extermination of the fly, as of the mosquito, can be brot about only by prevention of further breeding. Flies lay their eggs in heaps of rubbish, manure, refuse, garbage, or in any place where decaying matter is present. All such breeding places ought to be carted away and used as a fertilizer instead of fly incubators. If it is impossible to haul away the refuse, a little lime scattered over the surface will prevent fly breeding, though lime partially destroys the fertilizer value of manure. A solution of formalin or formaldehyde in water will destroy the eggs and larvae of the fly. To clear a room of flies heat a shovel or any similar article and drop thereon twenty drops of carbolic acid. The resulting vapor will kill the flies. If pyrethrum powder is burned in a room the flies will fall to the floor.

The extermination of the fly will follow the observing of the old rule, "Cleanliness is next to Godliness." So instead of tiring ourselves out with fly swatters, let's go out around the house and barn and do some really effective work.

Let each teacher devote a few lessons to the fly: its developement and growth, habits, places of breeding, disease carrying powers and necessity for extermination. Get the children interested in this problem and enlist their aid. Then we shall have done more than ever before to rid ourselves of the greatest pest we have—the house fly.

THE COUNTRY BOY'S CREED

I believe that the Country which God made is more beautiful than the City which man made; the life out-of-doors and in touch with the earth is the natural life of man. I believe that work is work wherever I find it, but that work with Nature is more inspiring than work with the most intricate machinery. I believe that the dignity of labor depends not on what you do, but on how you do it; that opportunity

comes to a boy on the farm as often as to a boy in the city, that life is larger and freer and happier on the farm than in the town, that my success depends not upon my location, but upon myself—not upon my dreams, but upon what I actually do, not upon luck, but upon pluck. I believe in working when you work, and in playing when you play, and in giving and demanding a square deal in every act of life.

—Edwin Osgood Grower.

The year's at the spring,
The day's at the morn;
Morning's at seven;
The hill-side's dew pearled.
The lark's on the wing;
The snail's on the thorn;
God's in his heaven—
All's right with the world!"

—Browning.



A CONSOLIDATED SCHOOL THAT REPLACED ELEVEN SMALLER SCHOOLS—"IN UNION THERE IS STRENGTH."



MAY NEWS NOTES



THOSE BANQUETERS.

Three hundred Agricultural students gathered at their annual banquet in Ohio Union on Friday evening, April 25th. After a sumptuous dinner the evening was spent in some enlivening fun, together with a discussion of the progress of Agriculture and the problems of rural life. Prof. Wm. R. Lazenby was a very capable toastmaster. The fact that Governor Cox was unable to be present was a sad disappointment to all.

The first speaker of the evening was Dean Price whose subject was "The Man and the Land." He spoke of the relation of the people to the value of the farm and to the community and the importance of forming ideals while in college.

The leading speaker and honored guest was Dean Davenport of the University of Illinois. He is one of the leading men in Agricultural lines today and brought to mind some new light on Agricultural prosperity when he spoke of "The Outlook of Agriculture." He said, "We are only pioneers in agriculture." He outlined three jobs for the young graduate, (1) to succeed in business himself to the honor of his college, (2) to aid others in attaining success, (3) to support his Alma Mater and the Agriculture of the State.

Prof. Plumb spoke of the opportunities afforded on the campus in preparation for "Getting into the game" of life. He said that the Agricultural Society should be supported and urged the students to help along the college

paper and boost whenever possible. Those who would get into the game here will get into it in the home community.

Other speakers were Mr. D. A. Crowner, who spoke on "The Creamery and the Farm," Paul Gelaugh on "Retrospection," and President Thompson who said, that profitable agriculture is the basis of future prosperity of the state. At a late hour the banquet was ended and all went home with a larger view of agriculture and its possibilities and all rejoiced that they had been permitted to break bread together once more.

The "Gala Season" will be ushered in on the 17th of this month, when a Horse Show will be given on the campus under the auspices of the Saddle and Sirloin Club. Great interest is being aroused in the coming of this event. Horses of both local and national fame will contest for honors which will incite the keenest of competition.

Dean White of the "Vet" college, spoke to the Saddle and Sirloin club last month. He read a very interesting paper on, "Diseases of Animals which are transmissible to man." A large crowd was in attendance, and thoroughly enjoyed the talk.

The Horticultural Department will materially assist in making the campus beautiful this spring by planting out a number of fine beds of shrubbery. The barren region about the Armory, especially will be beautified.

The University has recently received a shipment of several thousand shrubs for use on the campus. These will be kept in the nursery row for one year before being planted.

The West Virginia Extension Department recently secured the services of another fine Ohio State Graduate in the person of Walter Dutton, '12. Mr. Dutton will be in charge of the Horticultural work.

When his cares as instructor in Horticulture are ended this June, Mr. Jeffries is to leave for the Extension Department of West Virginia. Is Ohio State delivering the goods?

Ohio farmers suffered a loss of \$16,000,000 from wind and water in the recent flood disaster, according to reports received by the state board of agriculture from 1630 correspondents, representing 1000 townships. The damage to their buildings, fences, roads and livestock is estimated at \$7,000,000. Soil washing caused a loss of \$3,000,000. The damage to corn in the shock amounted to \$320,000.

Wheat in places suffered no loss but the average loss for the state for the 1913 crop is estimated at seven per cent. based on the acreage sown in 1912. In spite of this the wheat prospect for the coming year is optimistic. It should exceed the 1912 harvest by 15,000,000 bushels, if no handicap appears between now and threshing time.

Considerable damage was done to University farm by the flood of early April, which was as high as was ever known on the farm which lies directly in the valley. The greatest damage was encountered by the poultry plant, built only about a year ago. It was

entirely surrounded by water. Incubators in the basement of the instruction building were surrounded and destroyed together with 2,000 eggs due to hatch.

Other parts of the farm were badly washed, but the soil was not seriously injured. The hog barn was almost completely under water, but all of the stock was saved. A crib containing about 2,000 bushels of corn was covered, badly damaging the contents.

Dean H. C. Price attended the National Conference on Marketing and Farm Credit at Chicago, the middle of April.

The Lake Laboratory, at which the University conducts summer school for the study of zoology, botany and biology, has secured appropriations for the building of a dormitory. It will accommodate 25 students.

The Saddle and Sirloin Club of the Union Stock Yards, Chicago, are offering prizes amounting to \$120 for competitive essays on the subject of "Agricultural Education and the Farm." This club is endeavoring to secure a thorough discussion of the relation of a technical education to the social and economic phases of farming. It desires to know the opinion of students and therefore has limited the contestants to graduates and undergraduates. Any student desiring information can secure a copy of the rules and regulations at Dean Price's office.

The Chief Inspector of Apiaries of the Ohio Department of Agriculture reports 905 Apiaries inspected in 1912. These contained 8082 colonies which may be considered as representing the strength of the enterprise in the state.

The number of colonies reported in 1912 exceeds the number reported in 1911, when 309,523 pounds of honey was produced. First class comb honey is sold at retail, at the present time by Columbus dealers, at from twenty to twenty-five cents per pound. Inquiry at a number of places where honey is handled brought out the reply that they had none on hand and did not know where it could be purchased. It would seem from apparent conditions that the sale of honey in Ohio and other states could be increased many times very easily if the supply was forthcoming.

Mr. C. J. Grant who has been connected with the Extension Department since his graduation left the first of May to take a position at Springfield, Mass. The business men of Springfield are placing three men in charge of the County work. Mr. Grant will have charge of the Dairy and Farm Management work and will be associated with George Story and E. D. Wade formerly of the Extension Department.

An article appeared in our February issue regarding "stack ensilage." Some of our readers seem to desire further information on this subject. They can undoubtedly obtain such information by addressing the farm of the late Mr. David Rankin, Tarkio, Missouri, or Mr. Aiken, Zeandale, Kansas, who have made trials of putting up ensilage in this way. This method has also been tried out in Australia and New Zealand and letters to the Minister of Agriculture of New Zealand at Wellington, and the Minister of Agriculture of Australia at Melbourne, would doubtless bring additional information.

Prof. R. F. Griggs left the first of the month to make a study of the Kelp beds of Alaska. This work has been authorized by the Federal government which has also appointed several other men to assist Prof. Griggs. Their work is to make a complete survey of the giant Kelps of the Pacific ocean and to report on the feasibility of utilizing them as a source of potash for the American farmer.

Appropriations have been granted to make a Biological survey of the entire state. Prof. Herbert Osborn will have charge of the work. This is a very important phase of Zoology and the entire work under Prof. Osborn's direction is mainly in connection with the University work but the Ohio Academy of Science will also cooperate.

The annual field meet of Dimmick Bros. will be held June 2, at their farm at East Claridon, Ohio. This is one of the most important events in that part of Ohio. Many people come from all over the country to spend a day visiting with the world's most wonderful cows and enjoying the hospitality of the Dimmick Bros. From 2000 to 3000 people have attended past meets. An old fashioned picnic is one of the important features of these meets.

The largest and most elaborate test barn in the world was opened April 28 at the Anna Dean Farm, at Barberton, Ohio. This enormous barn is 700 feet long, 120 feet wide, is two stories high, has a steel frame with walks of concrete and brick. There are box stalls for 160 cows. The building is heated by hot water, has electric lights, electric fans, is well ventilated and represents the last word in sanitary construction.

Go Plant a Tree

Go plant a tree before thy door,
So birds can through its branches soar
And build their nests, like cooing dove—
Thus teach thee pure domestic love.

Go plant thee trees thy home around,
And pray that blessings may abound,
Like leaves that grow upon the trees
And hum a prayer with every breeze.

Go plant a tree beside the road
To cheer some traveler with his load,
And bless mankind of every grade
With cooling breeze and genial shade.

Go plant a tree on barren ground
So when the years have rolled around,
The tree may stand with shade and grace
And enrich the poor and barren place.

Go plant a tree within the wood
To take the place where once had stood
The mighty oak, or sturdy elm,
The monarch of the wooded realm.

Go plant a tree for future years—
To stay a drought and quell the fears
Of those who dread the sun-parched earth
Which yields to crops a horrid dearth.

Go plant a tree that long may stand
To check the gales that sweep our lands,
And stay the cyclone in its course,
And hold at bay the whirlwind's course.

Go plant a tree beside the grave
Of some dear friend both true and brave,
Where birds may come and chant their lays
As tho to sing his deeds with praise.

Go plant a tree by thy mother's grave,
Who risked her life for thine to save,
And blessed thy life with acts of love
And prayed for blessing from above.

Go plant, so thy monument shall be,
A living, growing, useful tree;
Which far excels the stoneman's craft,
Or marble pile, or granite shaft.

Go plant a tree in God's green earth
And thus do show thou hast some worth
In helping a great Nature's plan—
Thus serving God and helping man.

—William Beatty Powell.

Shadeland, Pa.

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Will organize a beginners' class Thursday evening, May 22nd, 7:30 o'clock.

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647 Neil Ave. Phones: Auto 4431; Bell 6189.

Will organize a beginners' class Tuesday evening, May 20th, 7:30 o'clock.

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827 Oak St. Phones: Auto 4431; Bell 6189.

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Gentlemen, per term of 10 lessons..... \$4 00

Ladies, per term of 10 lessons..... 3 00

Private lessons, \$1.00 per lesson; six lessons..... 5 00

Private lessons can be had afternoons or evenings.

Tuition can be paid \$1.00 per week until paid. The Waltz, Two-Step, Three-Step, Colum-

bus Minuet and Rye Waltz taught in one term.

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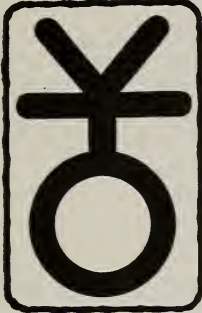
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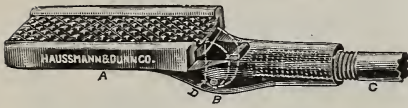


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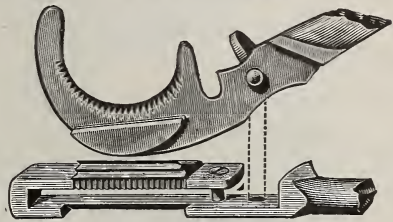
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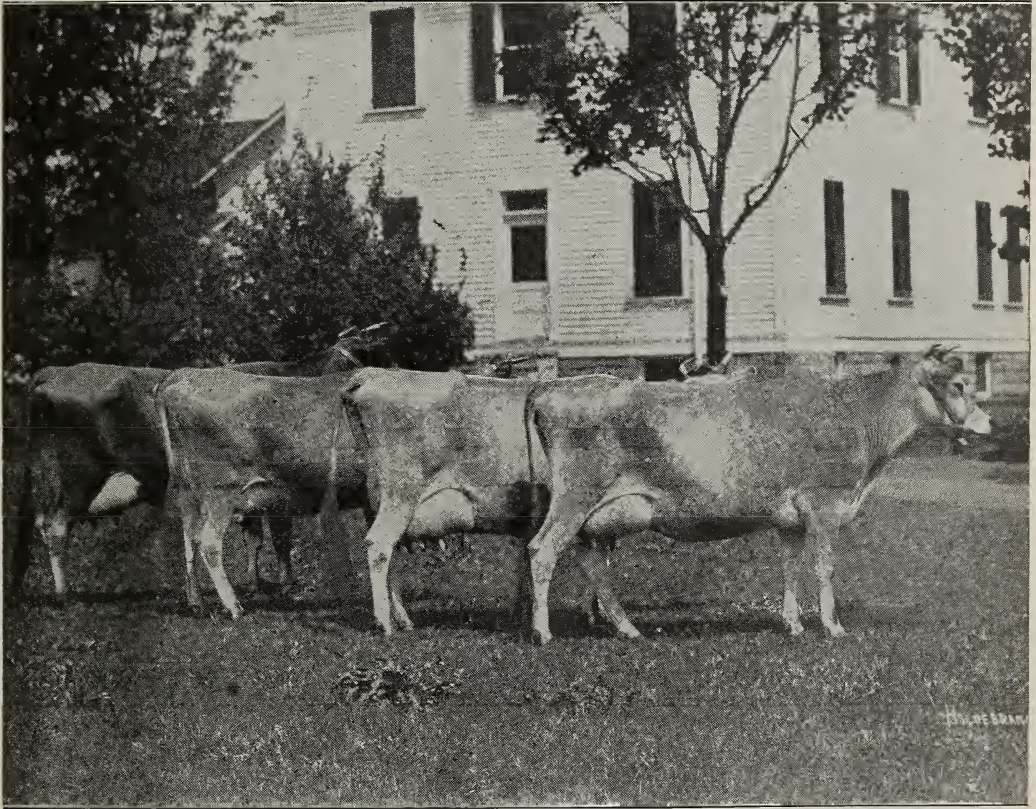
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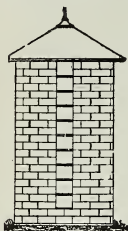
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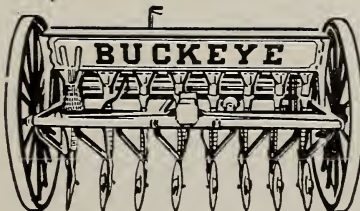
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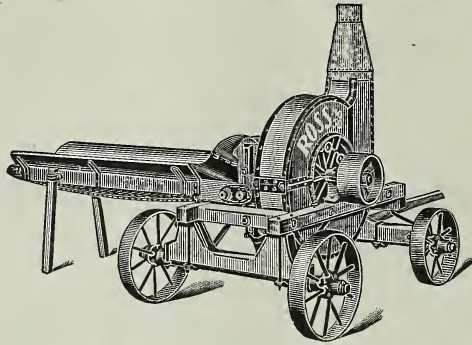
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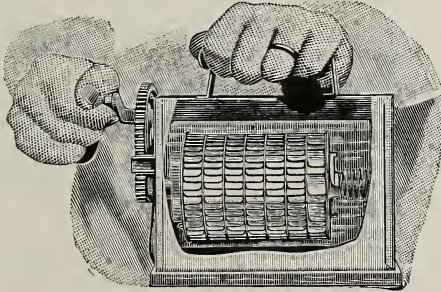
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Fig. 1345



Fig. 1287



Fig. 1384



Fig. 1160



Fig. 333



Fig. 1138

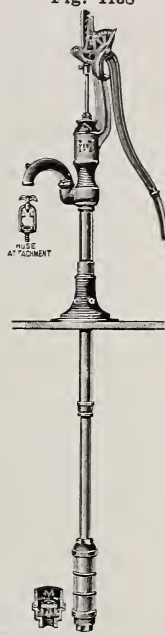


Fig. 813

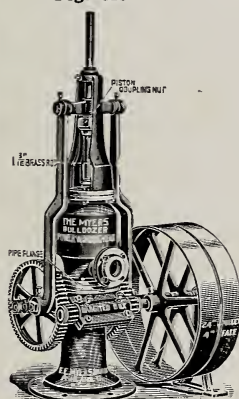
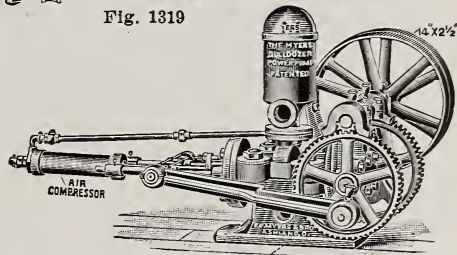


Fig. 1319



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